BAG

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a bag for holding a cleaning agent, a chemical, a foodstuff, a food material or the like which is in the form of a powder, lumps, a liquid, a viscous fluid, or the like.

2. Description of the Related Art

In recent years, due to environmental problems caused by industrial waste and the like, measures have begun to be taken to reduce amounts of garbage and conserve resources. As part of these measures, with regard to various types of container, there has begun to be a shift from using conventional hard bottles to using foldable soft containers, standing pouches from which a prescribed container or the like is refilled, and the like. Various proposals have thus been made regarding bags such as standing pouches.

For example, Japanese Patent Application Laid-open No. H11-70947 discloses a liquid sealing bag wherein an overlapping section for sealing is formed at the upper edge portion, a pouring mouth that is continuous with a liquid-housing space formed inside the bag is formed at either the left edge or the right edge of the

overlapping section for sealing so as to stick out in a trapezoidal shape, a V-shaped cutout section is cut out in the vicinity of the pouring mouth, and by means of this cutout section the overlapping section for sealing is divided into a sealing portion having the pouring mouth and another portion having no pouring mouth. With this bag, the bag is opened by cutting the upper edge portion of the pouring mouth with scissors or the like. The pouring mouth can then be directly inserted into the opening of a prescribed container, meaning that the contents of the bag can be transferred into the prescribed container simply and reliably.

Moreover, Japanese Patent Application Laid-open No. H11-180448 discloses (1) a bag wherein a diagonal sealing part is provided at the top, and a pouring mouth for the contents is formed by using scissors or the like to cut diagonally from either the left side edge or the right side edge relative to the diagonal sealing part, and wherein the sealing angle of the diagonal sealing part relative to the above-mentioned left or right side edge is set in accordance with the contents, and (2) a sealing device for the bag. With this bag, the size of the pouring mouth can be suitably set in accordance with the properties of the contents.

Moreover, Japanese Patent Application Laid-open No. H11-314652 discloses a liquid packaging container wherein a pouring mouth is formed at either the left corner or the right corner of the upper part (stepped portions are formed at the top and sides of this pouring mouth, meaning that the pouring mouth is approximately beak-shaped), a protrusion is provided on at least

one of the front face sheet and the rear face sheet that constitute the pouring mouth, and a strip pushing line that continues on from this protrusion is provided. With this container, when the contents are poured out from the pouring mouth after the pouring mouth has been cut open with scissors or the like, the protrusion and the strip pushing line prevent the pouring mouth from closing up.

Moreover, Japanese Patent Application Laid-open No. H6-127553 discloses a liquid containing bag wherein a left/right pair of heat sealed parts are provided in the vertical direction at a position slightly above the center of the bag in the vertical direction. With this bag, the heat sealed parts prevent the bag from losing its shape when a container is refilled from the bag.

However, with a conventional standing pouch or the like such as that shown in Fig. 13 for which a single upper heat sealed part 20 is formed at the upper edge portion, when a pouring mouth 21 for the contents is formed (see Fig. 14), the pouch is ripped open along the upper edge from a notch 22 using fingers or the like (see the arrow in Fig. 13) so that the heat sealed part 20 is ripped off, and so the resulting pouring mouth 21 tends to buckle easily. There is thus a problem in which the contents come out of the pouring mouth 21 all at once when a prescribed container or the like is refilled from the standing pouch. There is also a problem that, if the standing pouch or the like is turned upside down during such refilling, then the weight of the contents moving down towards the pouring mouth 21 may cause a loss of shape in which the central part of the standing pouch or the like gives way, and a problem

that, if the contents move sideways, meaning that the position from which the contents pour out shifts sideways, then the contents may scatter around away from the opening of the prescribed container or the like and/or spill out, meaning that the refilling operation cannot be carried out smoothly. This is of particular concern, from the point of view of safety, in the case that the contents are a chemical that contains a substance that irritates or corrodes the skin.

Moreover, when forming the pouring mouth 21, each worker will tend to make a cut of a desired length using scissors or the like and then carry out the refilling operation. The length cut to (and thus the size of the pouring mouth 21) will depend on experience and vary from worker to worker, meaning that the refilling operation is not carried out as smoothly as it might be. Such drawbacks also apply in the case that a cut is made diagonal to the upper edge using scissors or the like when forming the pouring mouth 21.

Moreover, with Japanese Patent Application Laid-open No. H11-70947, the pouring mouth is formed at either the left edge or the right edge of the overlapping section for sealing so as to stick out in a trapezoidal shape, meaning that the formation of the overlapping section for sealing is complicated and so a special sealing device is required, and moreover a V-shaped cutout section is cut out which results in the overlapping section for sealing becoming weaker and prone to breakage or the like. In addition, scissors or the like are required for cutting the upper edge portion of the pouring mouth, which is not very handy.

Moreover, with Japanese Patent Application Laid-open No. H11-180448, Japanese Patent Application Laid-open No. H11-314652 and Japanese Patent Application Laid-open No. H6-127553, either the left corner or the right corner of the upper part is cut diagonally when forming the pouring mouth. A prescribed distance is usually maintained between the contents and the pouring mouth so that the contents will not come out of the pouring mouth suddenly. This means that if the pouring mouth is formed diagonal to the upper edge, then the overall shape of the bag has to be made longer in the vertical direction than when the pouring mouth is formed parallel to the upper edge, and as a result buckling at the central part becomes more prone to occur.

Moreover, with Japanese Patent Application Laid-open No. H11-180448, a diagonal sealing part is provided at the top of the bag across the whole width in the sideways direction, meaning that the overall shape of the bag becomes rather long in the vertical direction, and buckling at the central part becomes very prone to occur. Furthermore, when a cut is made at an angle to the diagonal sealing part when forming the pouring mouth, this cut is at an angle to (for example orthogonal to) the fibers (the directionality of the structure) of the sheets that make up the bag, meaning that it is not possible to make the cut by ripping with ones fingers or the like. Scissors or the like are thus required, which is not very handy. Furthermore, an acute angle is formed at the upper edge portion of the diagonal sealing part, meaning that this portion becomes weak, and buckling and/or breakage become prone to occur.

Moreover, with Japanese Patent Application Laid-open No. H11-314652, an approximately beak-shaped pouring mouth is formed at either the left corner or the right corner of the upper part, meaning that formation of the heat sealed part is complicated and so a special sealing device is required, and moreover the above-mentioned left or right corner becomes weak and breakage or the like becomes prone to occur.

Moreover, with Japanese Patent Application Laid-open No. H6-127553, a left/right pair of heat sealed parts are provided in the vertical direction at a position slightly above the center of the bag in the vertical direction, and the contents are made to pass between these heat sealed parts, meaning that the overall shape of the bag becomes long in the vertical direction, and moreover the passage through which the contents pass is narrowed by the heat sealed parts and so some of the contents tend to remain around this area. Furthermore, it is necessary to tip the bag downwards by a large angle when a prescribed container or the like is refilled from the bag, meaning that the refilling operation is difficult to carry out.

SUMMARY OF THE INVENTION

With the foregoing in view, an object of the present invention is to provide a bag for which: refilling can be carried out smoothly, without the contents coming out of the pouring mouth all at once and without the bag losing its shape; the pouring mouth can be set

to a certain specific size; a special sealing device is not required; the bag is strong; the overall shape of the bag does not have to be made long in the vertical direction; the refilling can be carried out easily, without scissors or the like being required when forming the pouring mouth, and without any of the contents remaining in the bag during pouring.

In order to achieve the above-mentioned object, the bag of the present invention, having heat sealed parts formed at the left and right side edges and the bottom that is closed up, is made to have a structure in which, at the top, a first heat sealed part that closes up the top opening is formed along the upper edge portion, and a second heat sealed part is formed diagonally to extend from the first heat sealed part to either one of the heat sealed parts formed at the left and right side edges, and when the bag is opened by ripping along the upper edge portion from a notch for opening, at least part of the first heat sealed part is ripped away, and part of the second heat sealed part remains behind on the main part of the bag.

The bag of the present invention is thus a bag for which heat sealed parts are formed at the left and right side edges and the bottom is closed up, and is such that, at the top, a first heat sealed part that closes up the top opening is formed along the upper edge portion, and a second heat sealed part is formed diagonally across the first heat sealed part and either the heat sealed part formed at the left side edge or the heat sealed part formed at the right side edge. Moreover, the bag is formed in such a way that,

when the bag is opened by ripping along the upper edge portion from a notch for opening, at least part of the first heat sealed part is ripped away, and part of the second heat sealed part remains behind on the main part of the bag. In this way, with the bag of the present invention, part of the second heat sealed part remains [behind on the main part of the bag] after the bag has been opened, and so the pouring mouth is reinforced by this part of the second heat sealed part. As a result, the contents do not come out of the pouring mouth all at once during refilling. Moreover, even if the bag is turned upside down during refilling, because of the above-mentioned reinforcement the central part of the bag does not buckle, and the bag does not lose its shape. Moreover, the refilling operation can be carried out smoothly without the contents scattering around away from the opening of the prescribed container or the like and/or spilling out. Furthermore, the pouring mouth is formed by ripping open the bag along the upper edge portion from the notch, and so the size of the pouring mouth (i.e. the distance between the notch and the second heat sealed part) can be set to a desired value by suitably setting the position and angle of inclination of the second heat sealed part and the like, meaning that the refilling operation can be carried out smoothly by all workers.

Moreover, the first and second heat sealed parts can simply be formed in straight lines, meaning that a special sealing device is not required. Furthermore, because the first heat sealed part is formed along the upper edge portion, the upper edge portion

becomes stronger and is not prone to buckling or breakage. Furthermore, the overall shape of the bag does not have to be made long in the vertical direction. Furthermore, there is nothing to narrow the passage in the bag through which the contents pass, and so the problem in which some of the contents remain in the bag during pouring tends not to occur, and moreover the pouring can be carried out with the bag tipped downwards at a normal angle, meaning that the refilling operation can be carried out easily. Furthermore, when the pouring mouth is formed by ripping the bag open along the upper edge portion from the notch, the rip is made along the fibers (the directionality of the structure) of the sheets that make up the bag, and so can easily be performed using ones fingers or the like, and without scissors or the like being required. Note that when opening the bag, it is merely necessary to use ones fingers or the like to rip away the portion of the first heat sealed part corresponding to the portion between the notch and the second heat sealed part - it is not necessary to cut off the whole of the first heat sealed part using scissors or the like (part of the first heat sealed part remains behind on the main part of the bag). In this way, a pouring mouth of the desired size can be formed.

Moreover, one could also envisage producing a bag provided with three heat sealed parts (an upper heat sealed part 24 formed along the upper edge portion of the bag, and a left/right pair of inclined heat sealed parts 25 and 26 formed at the right and left sides of the upper heat sealed part 24; see Fig. 15), for which a funnel-shaped pouring mouth (not shown) is formed by cutting open

the bag along the upper edge portion from a notch (see the arrow in Fig. 15; the notch is not shown). However, with such a bag, inclined heat sealed parts 25 and 26 would be formed on both sides, and so the bag could only be opened by cutting with scissors or the like. Furthermore, since two inclined heat sealed parts 25 and 26 would have to be formed, the number of steps required to produce the bag would increase. Furthermore, the bag would have to be tipped downwards by a large angle during refilling, making the refilling operation difficult.

Following is a detailed description of the present invention.

The bag of the present invention is such that heat sealed parts are formed at the left and right side edges and the bottom is closed up, and is provided with a first heat sealed part, a second heat sealed part, and a notch for opening.

The bag of the present invention may either be a free-standing type such as a standing pouch, or a non-free-standing type. Moreover, the bag of the present invention is ideal as a refill bag for refilling a prescribed container, dispenser or the like with contents.

Examples of the above-mentioned contents (i.e. the contents held in the bag of the present invention) include a cleaning agent, a chemical, a foodstuff or a food material. Out of these, since consideration has been given to safety during filling/refilling operations, the bag of the present invention exhibits its effects to the full when the contents are a cleaning agent or a chemical.

Examples of the above-mentioned cleaning agent include

detergents for automatic dishwashers, drying/finishing agents for automatic dishwashers, cleaning agents for carpets, and special detergents for fryers. Examples of the above-mentioned chemical include carpet powders, agents for solidifying used cooking oil, bleaching agents for tableware, bleaching agents for clothing, floor waxes, and polishes.

The above-mentioned contents may be in any of various forms, for example a powder, lumps, a liquid, or a viscous fluid, although it is particularly preferable for the form to be a powder or lumps. It is most preferable for the contents to be a cleaning agent or a chemical in the form of a powder.

The bag of the present invention is used for holding a cleaning agent, a chemical, a foodstuff, a food material or the like, although a particularly preferable use is for holding a cleaning agent or a chemical. It is most preferable for the bag to be used for holding a cleaning agent or a chemical in the form of a powder.

When the bag of the present invention is a free-standing type, the bag is generally formed from a front face sheet, a rear face sheet and a base sheet. When the bag of the present invention is a non-free-standing type, the bag is generally formed from a front face sheet and a rear face sheet. Any of various plastic materials can be used as the constituent materials of these sheets, although particularly preferable examples include polyethylene terephthalate, nylon or drawn nylon for the outer surface of each sheet, and linear low density polyethylene for the inner surface

of each sheet. Moreover, intermediate layers made of aluminum foil, drawn nylon or the like may also be provided. Furthermore, antistatic agents and the like may be added to any of the various plastic materials used for the inner and outer surfaces of the sheets. Moreover, if appropriate, a product name, instructions for usage or the like may be formed, for example, on the outer surface of any of the sheets by printing or the like.

Each of the above-mentioned sheets may, for example, be produced by laminating in order polyethylene terephthalate (which will become the outer surface), aluminum foil, drawn nylon, and linear low density polyethylene (which will become the inner surface). When producing the bag using such sheets, the polyethylene terephthalate is made to be on the outer surface and the linear low density polyethylene is made to be on the inner surface.

Moreover, each of the above-mentioned sheets may, for example, be produced by laminating in order nylon (which will become the outer surface), aluminum foil, and linear low density polyethylene (which will become the inner surface), or by laminating in order polyethylene terephthalate (which will become the outer surface), drawn nylon, and linear low density polyethylene (which will become the inner surface).

Moreover, each of the above-mentioned sheets may, for example, be produced by laminating nylon (which will become the outer surface) and linear low density polyethylene (which will become the inner surface), or by laminating polyethylene terephthalate

(which will become the outer surface) and linear low density polyethylene (which will become the inner surface), or by laminating drawn nylon (which will become the outer surface) and linear low density polyethylene (which will become the inner surface).

The above-mentioned sheets can be used in combination (as front face, rear face and base sheets) as appropriate. Moreover, from the point of view of safety in case the bag happens to be dropped, it is preferable for the overall thickness of each sheet to be set between 110 and 170 μm, and from the point of view of economics and garbage reduction, it is most preferable for this thickness to be set between 120 and 150 μm.

With the bag of the present invention, in order for a pouring mouth of a prescribed size to be formed when the bag is opened, the position where the first heat sealed part and the second heat sealed part (which is formed diagonally across the first heat sealed part and either the left or the right side edge heat sealed part) overlap is set to be a prescribed distance inwards from the other one of the left and right side edge heat sealed parts. This position is preferably set between 60 and 120 mm - most preferably between 60 and 100 mm - inwards from the aforementioned other one of the left and right side edge heat sealed parts. Moreover, in order for a reinforcement effect to be realized after the bag has been opened, the position in question is preferably set between 70 and 130 mm - most preferably between 90 and 130 mm - inwards from the aforementioned other one of the left and right side edge heat sealed

parts.

Moreover, the bag of the present invention is such that part of the second heat sealed part remains behind on the main part of the bag after the bag has been opened. The notch is thus formed, on the side edge that is not crossed by the second heat sealed part, in a position below the first heat sealed part but a prescribed distance above the bottom end of the second heat sealed part. Firstly, the position of the bottom end of the second heat sealed part, which is at either the left or the right side edge, is preferably set between 50 and 120 mm - most preferably between 60 and 100 mm - below the upper edge of the bag. The notch is then formed in a position preferably between 10 and 50 mm below the first heat sealed part and at least 30 mm above the bottom end of the second heat sealed part, most preferably between 15 and 40 mm below the first heat sealed part and at least 35 mm above the bottom end of the second heat sealed part. The notch may be, for example, V-shaped, U-shaped or I-shaped. In this way, the desired reinforcement effect is realised.

The widths of the first and second heat sealed parts are preferably set between 3 and 12 mm, most preferably between 5 and 10 mm.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an explanatory drawing showing an embodiment of the bag of the present invention;

Fig. 2 is a cross-sectional view of major parts of the bag of Fig. 1;

Fig. 3 is an explanatory drawing showing the bag of Fig. 1 after opening;

Fig. 4 is an explanatory drawing showing a bulk powder adapter;

Fig. 5 is an explanatory drawing showing a bulk powder adapter being set in a Viking bowl;

Fig. 6 is an explanatory drawing showing refilling being carried out;

Fig. 7 is an explanatory drawing showing another way of carrying out refilling;

Fig. 8 is an explanatory drawing showing another embodiment of the bag of the present invention;

Fig. 9 is an explanatory drawing of the standing pouch of Example 3;

Fig. 10 is an explanatory drawing of the bag of Example 4;

Fig. 11 is an explanatory drawing of the standing pouch of Example 5;

Fig. 12 is an explanatory drawing of the bag of Example 6;

Fig. 13 is an explanatory drawing of a conventional example;

Fig. 14 is an explanatory drawing showing the conventional example of Fig. 13 after opening; and

Fig. 15 is an explanatory drawing of another conventional example.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Following is a detailed description of embodiments of the present invention with reference to the drawings.

Fig. 1 shows an embodiment of the bag of the present invention. In this embodiment, a free-standing type standing pouch 1 is used as the bag (see Fig. 2), and this standing pouch holds a cleaning agent powder (not shown). Drawn nylon (thickness 15 μm) (outer surface side) and linear low density polyethylene (thickness 120 μm) (inner surface side) are used as the constituent materials of a front face sheet 2, a rear face sheet 3 and a base sheet 4 that make up the standing pouch 1. The sheets 2 to 4 are produced by laminating these constituent materials in the above-mentioned order. When producing the standing pouch 1 using the sheets 2 to 4, the polyethylene terephthalate[1] is made to be on the outer surface, and the linear low density polyethylene is made to be on the inner surface. In this embodiment, the capacity of the bag is set to 2kg (of the cleaning agent powder), the length of the upper edge is set between 180 and 220 mm, and the length of each of the left and right side edges is set between 260 and 320 mm. In the Examples and Comparative Examples described later, the capacity of the bag is set to 2kg, the length of the upper edge is set to 200 mm, and the length of each of the left and right side edges is set to 280 mm.

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[1] **Drawn nylon in [0035], line 5 becomes polyethylene terephthalate in [0035], line 8.**

Parts 5 and 6 are right and left side heat sealed parts formed at the right and left side edges of the standing pouch 1. Part 7 is a bottom heat sealed part formed at the bottom of the standing pouch 1. Part 8 is an upper heat sealed part (first heat sealed part) formed at the upper edge portion (specifically, slightly below the upper edge) of the standing pouch 1 and running parallel to the upper edge; this upper heat sealed part is formed in the sideways direction across the whole width of the upper edge portion. Part 9 is an inclined heat sealed part (second heat sealed part) formed diagonally across the upper edge of the standing pouch 1 and either the left side edge or the right side edge (in Fig. 1, the right side edge); this inclined heat sealed part 9 cuts across the upper heat sealed part 8 at the upper edge portion of the standing pouch 1, and overlaps with the right side heat sealed part 5 at the right edge portion. Moreover, the top end of the inclined heat sealed part 9 is set to be in a position a prescribed distance inwards from the other one of the left and right side edges (in Fig. 1, the left side edge).

10 is a notch for opening formed in the left side heat sealed part 6; this notch is cut in a U-shape. The notch 10 is formed in a position below the upper heat sealed part 8, but a prescribed distance above the bottom end of the inclined heat sealed part 9. This means that, when the standing pouch 1 is opened by ripping along the upper edge from the notch 10, part of the upper heat sealed part 8 is ripped away (the portion between the notch 10 and the inclined heat sealed part 9), and part of the inclined heat sealed

part 9 remains [behind on the main part of the standing pouch 1] (see Fig. 3).

With this configuration, when forming a pouring mouth 11 (see Fig. 3), the standing pouch 1 is ripped open from the notch 10 to the inclined heat sealed part 9, with this rip being parallel to the upper edge. The rip is made along the fibers that make up the front face sheet 2 and the rear face sheet 3 (i.e. the directionality of the structure), and can thus be performed easily with fingers or the like. Moreover, the pouring mouth 11 formed by ripping in this way can be set to a certain specific size. Furthermore, after the ripping, part of the inclined heat sealed part 9 remains [behind on the main part of the standing pouch 1] and performs a reinforcing role.

After the standing pouch 1 has been opened, a bulk powder adapter 15 (made by Viking) (see Fig. 4) is refilled with the cleaning agent powder in the standing pouch 1. The bulk powder adapter 15 comprises a tube-shaped main body 16, and a cap 17 for which a screen (not shown) is formed on the lid part. The bottom end opening 16a of the tube-shaped main body 16 is covered with the cap 17 (which can be freely attached to and detached from the bottom end opening 16a), and the bulk powder adapter 15 is set on the upper part of a Viking bowl 18 (made by Viking) (see Fig. 5) (the bulk powder adapter 15 can be freely attached to and detached from the Viking bowl 18). During the refilling, the cleaning agent in the standing pouch 1 is poured out of the pouring mouth 11 of the standing pouch 1, and is filled into the tube-shaped main body

16 via a top end opening 16b of the tube-shaped main body 16, as shown in Fig. 6. When the cleaning agent is to be used, a jet of water is fired at the lid part of the cap 17 from a jet nozzle (not shown) provided inside the Viking bowl 18, whereupon the jet of water passes through the screen of the lid part and into the bulk powder adapter 15, dissolving the cleaning agent. The resulting solution drops down through the screen and is fed into a dishwasher (not shown) from a cleaning solution discharge port 19. Note that in Fig. 6, the standing pouch 1 is oriented with the inclined heat sealed part 9 at the top, but the standing pouch 1 may also be oriented with the inclined heat sealed part 9 at the bottom as in Fig. 7.

As described above, with this embodiment, part of the inclined heat sealed part 9 remains behind on the main part of the standing pouch 1 after the pouring mouth 11 has been formed by ripping parallel to the upper edge from the notch 10, and so the pouring mouth 11 is reinforced by this part of the inclined heat sealed part 9. This means that the cleaning agent powder does not come out of the pouring mouth 11 all at once during refilling, and the central part of the standing pouch 1 does not buckle, and moreover the cleaning agent powder does not spill out or get scattered around. Furthermore, the pouring mouth 11 can be made to be a certain specific size, meaning that the refilling operation can be carried out smoothly.

Moreover, the upper heat sealed part 8 and the inclined heat sealed part 9 are formed in straight lines, meaning that a special

sealing device is not required. Furthermore, because the upper heat sealed part 8 is formed, the standing pouch is strong. Furthermore, the standing pouch 1 can easily be ripped open from the notch 10 using ones fingers or the like when forming the pouring mouth 11, meaning that scissors or the like need not be used. Furthermore, the upper heat sealed part 8 and the inclined heat sealed part 9 are combined, meaning that the overall shape of the standing pouch 1 does not become long in the vertical direction. Furthermore, all of the cleaning agent powder can be poured out simply by tipping the standing pouch 1 downwards at a normal angle, meaning that the refilling operation can be carried out easily.

Fig. 8 shows another embodiment of the bag of the present invention. In this embodiment, a non-free-standing type of bag is used. The bag comprises a front face sheet 2 and a rear face sheet 3 (see Fig. 2). Other parts are as with the above-mentioned embodiment, with corresponding parts being given the same reference numeral. The bag of the present embodiment exhibits similar functions and effects to the standing pouch of the above-mentioned embodiment.

Following is a description of Examples along with Comparative Examples.

Examples 1, 2

In Example 1, the standing pouch 1 shown in Fig. 1 is used, and the dimensions of the various parts are set as shown in Fig. 1 (units here and hereinafter are mm). In Example 2, on the other

hand, the non-free-standing type bag 1 shown in Fig. 8 is used; the dimensions of the various parts are set to be the same as with Example 1 (with the exception of the base sheet 4) (see Fig. 8).

Examples 3, 4

In Example 3, the free-standing type standing pouch 1 shown in Fig. 9 is used, with this standing pouch 1 holding a cleaning agent powder. Nylon (thickness 25 μm) (outer surface side), aluminum foil (thickness 7 μm), and linear low density polyethylene (thickness 120 μm) (inner surface side) are used as the constituent materials of the front face sheet 2, rear face sheet 3 and base sheet 4 (see Fig. 2) that make up the standing pouch 1. The sheets 2 to 4 are produced by laminating these constituent materials in the above-mentioned order. When producing the standing pouch 1 using the sheets 2 to 4, the nylon is made to be on the outer surface, and the linear low density polyethylene is made to be on the inner surface. In Example 3, the dimensions of the various parts are set as shown in Fig. 9. Other parts have a similar structure to the standing pouch 1 shown in Fig. 1, with corresponding parts being given the same reference numeral. In Example 4, on the other hand, the non-free-standing type bag 1 shown in Fig. 10 is used. The dimensions of the various parts are set to be the same as with Example 3 (with the exception of the base sheet 4) (see Fig. 10). Other parts have a similar structure to the bag shown in Fig. 8, with corresponding parts being given the same reference numeral.

Examples 5, 6

In Example 5, the free-standing type standing pouch 1 shown in Fig. 11 is used, with this standing pouch 1 holding a cleaning agent powder. Polyethylene terephthalate (thickness 12 μm) (outer surface side), drawn nylon (thickness 15 μm), and linear low density polyethylene (thickness 130 μm) (inner surface side) are used as the constituent materials of the front face sheet 2, rear face sheet 3 and base sheet 4 (see Fig. 2) that make up the standing pouch 1. The sheets 2 to 4 are produced by laminating these constituent materials in the above-mentioned order. When producing the standing pouch 1 using the sheets 2 to 4, the polyethylene terephthalate is made to be on the outer surface, and the linear low density polyethylene is made to be on the inner surface. In Example 5, the dimensions of the various parts are set as shown in Fig. 11. Other parts have a similar structure to the standing pouch 1 shown in Fig. 1, with corresponding parts being given the same reference numeral. In Example 6, on the other hand, the non-free-standing type bag 1 shown in Fig. 12 is used. The dimensions of the various parts are set to be the same as with Example 5 (with the exception of the base sheet 4) (see Fig. 12). Other parts have a similar structure to the bag shown in Fig. 8, with corresponding parts being given the same reference numeral.

Moreover, various other examples can be produced by taking one of the above-mentioned Examples and using, as the constituent materials of each of the sheets 2-4, either polyethylene terephthalate (thickness 12 μm) (outer surface side), aluminum

foil (thickness 7 μm), drawn nylon (thickness 15 μm), and linear low density polyethylene (thickness 100 μm) (inner surface side), or polyethylene terephthalate (thickness 12 μm) (outer surface side), nylon (thickness 25 μm), and linear low density polyethylene (thickness 120 μm) (inner surface side), or polyethylene terephthalate (thickness 12 μm) (outer surface side) and linear low density polyethylene (thickness 150 μm) (inner surface side), or drawn nylon (thickness 15 μm) (outer surface side) and linear low density polyethylene (thickness 150 μm) (inner surface side), with the constituent materials being laminated in the stated order in each case.[2]

Comparative Examples 1, 2

In Comparative Example 1, a free-standing type standing pouch 1 like that shown in Fig. 1 is used, only the position where the upper heat sealed part 8 and the inclined heat sealed part 9 overlap is made to be 65 mm (as opposed to 110 mm previously) inwards from the right side heat sealed part 5 (no drawing provided). In Comparative Example 2, on the other hand, a non-free-standing type bag 1 like that shown in Fig. 8 is used, only (similar to Comparative Example 1) the position where the upper heat sealed part 8 and the inclined heat sealed part 9 overlap is made to be 40 mm inwards from the right side heat sealed part 5 (no drawing provided).

[2] Last sentence of [0047] appears superfluous (*atsumi* is written in all brackets) so ignored.

Comparative Examples 3, 4

In Comparative Example 3, a free-standing type standing pouch 1 like that shown in Fig. 9 is used, only the position of the bottom end of the inclined heat sealed part 9 is made to be 45mm (as opposed to 60 mm previously) below the upper edge (no drawing provided). In Comparative Example 4, on the other hand, a non-free-standing type bag 1 like that shown in Fig. 10 is used, only as with Comparative Example 3 the position of the bottom end of the inclined heat sealed part 9 is made to be 45mm below the upper edge (no drawing provided).

The reinforcement effects were investigated for the bags of above-mentioned Examples 1 to 6 and the bags of above-mentioned Comparative Examples 1 and 2. With the bags of Examples 1 to 6, problems such as the cleaning agent powder coming out of the pouring mouth 11 all at once during refilling, or the bag losing its shape, did not occur. However, with the bags of both Comparative Example 1 and Comparative Example 2, these problems did occur. Moreover, when the bag bodies of Examples 1 to 6 were filled with 2kg of a dishwasher cleaning agent powder, left for 48 hours in an incubator at 5°C or 25°C, and then dropped under gravity from a height of 2m either trunk-first or bottom-first onto a concrete floor, none of the bags ruptured, nor was there any leakage of the contents, thus showing that the bags in question are sufficiently strong for practical purposes.

Effects of the invention

As described above, with the bag of the present invention, the pouring mouth is reinforced by the second heat sealed part after the bag has been opened, meaning that the problem in which the contents come out of the pouring mouth all at once during refilling does not occur. Moreover, even if the bag is turned upside down during refilling, because of the above-mentioned reinforcement the central part of the bag does not buckle and the bag does not lose its shape. Moreover, the refilling operation can be carried out smoothly without the contents scattering around away from the opening of the prescribed container or the like and/or spilling out. Furthermore, the pouring mouth is formed by ripping open the bag along the upper edge portion from the notch, and so the size of the pouring mouth (i.e. the distance between the notch and the second heat sealed part) can be set to a desired value by suitably setting the position and angle of inclination of the second heat sealed part and the like, meaning that the refilling operation can be carried out smoothly by all workers.

Moreover, the first and second heat sealed parts can simply be formed in straight lines, meaning that a special sealing device is not required. Furthermore, because the first heat sealed part is formed along the upper edge portion, the upper edge portion becomes stronger and is not prone to buckling or breakage. Furthermore, the overall shape of the bag does not have to be made long in the vertical direction. Furthermore, there is nothing to narrow the passage in the bag through which the contents pass, and so the problem in which some of the contents remain in the bag during

pouring tends not to occur, and moreover the pouring can be carried out with the bag tipped downwards at a normal angle, meaning that the refilling operation can be carried out easily. Furthermore, when the pouring mouth is formed by ripping the bag open along the upper edge portion from the notch, the rip is made along the fibers (the directionality of the structure) of the sheets that make up the bag, and so can easily be performed using ones fingers or the like, and without scissors or the like being required. Note that when opening the bag, it is merely necessary to use ones fingers or the like to rip away the portion of the first heat sealed part corresponding to the portion between the notch and the second heat sealed part - it is not necessary to cut off the whole of the first heat sealed part using scissors or the like (part of the first heat sealed part remains [behind on the main part of the bag]). In this way, a pouring mouth of the desired size can be formed.

Moreover, one could also envisage producing a bag provided with three heat sealed parts (an upper heat sealed part 24 formed along the upper edge portion of the bag, and a left/right pair of inclined heat sealed parts 25 and 26 formed at the right and left sides of the upper heat sealed part 24; see Fig. 15), for which a funnel-shaped pouring mouth (not shown) is formed by cutting open the bag along the upper edge portion from a notch (see the arrow in Fig. 15; the notch is not shown). However, with such a bag, inclined heat sealed parts 25 and 26 would be formed on both sides, and so the bag could only be opened by cutting with scissors or the like. Furthermore, since two inclined heat sealed parts 25 and

26 would have to be formed, the number of steps required to produce the bag would increase. Furthermore, the bag would have to be tipped downwards by a large angle during refilling, making the refilling operation difficult.